

Artificial Intelligence, Neom and Saudi Arabia's Economic Diversification from Oil and Gas

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Abstract

Saudi Arabia is diversifying its economy by becoming a global technological hub. Driven by its 'Vision 2030' initiative, it has embarked on the most ambitious and far-reaching transformation plan in the Kingdom's history. At the core of this transformation are the investment and development of artificial intelligence (AI) and its integration into a new mega-city, Neom. Currently under construction, Neom is seeking to integrate robotics and AI seamlessly into every aspect of citizens' lives in a bid to generate revenues from key economic sectors for the future. This transition from an economy based on hydrocarbons to AI is, however, more than economic. It is a bid to secure the survival of the House of Saud and meet the growing challenges of constructing a state around oil. Nevertheless, what happens in Neom may provide insights into how AI will impact the world beyond a cross-roads built on sand.

Keywords: Saudi Arabia, artificial intelligence, Neom, oil, political economy

Introduction

IT IS COMMONPLACE to hear suggestions of an artificial intelligence (AI) 'arms race' taking shape between the United States and China. However, this great power rivalry often drowns discussion about AI developments elsewhere. This is unfortunate because this new technology is already marching across the globe and having significant geopolitical implications. Notably, it is in the Gulf region where the embrace of AI technology and development appears to be both strongest, and most surprising, given the region's limited population size. Saudi Arabia, the United Arab Emirates and Qatar are already embracing AI strategies that are arguably more advanced than many other countries around the world. In Saudi Arabia, this embrace is not peripheral, but rather a fundamental pillar of its economic development strategy. When the Kingdom announced its 'Vision 2030' programme, seeking to diversify the economy away from reliance on hydrocarbon energy, it declared that 'AI is at the heart of this endeavour. It permeates all aspects of Vision 2030.'¹ This plan is nothing short of an attempt to remake the Saudi

economy. However, as the state attempts the largest and most ambitious transformation plan since the advent of oil, its reliance on AI will inevitably grow.

Signalling the importance of AI to Saudi Arabia's economic development, the Global Artificial Intelligence Summit 2020 will be held in Riyadh. At the behest of Crown Prince Mohammed bin Salman, the summit promises to bring together expertise in AI and be a significant international forum dedicated to the advancement of AI technology. Saudi Arabia is attempting to become a global leader in the technology and a central hub for global AI expertise networks. The Kingdom is seeking to pull together emerging trends and capitalise on this technology's promise of creating a 'civilizational leap for humanity'.² Saudi Arabia is attempting to recast its identity as a technological leader in advanced manufacturing, technological research and design, and as the hub of a new technological silk road linking three continents. We show how this approach reveals a long-term structural need for Saudi Arabia to move away from economic reliance on oil and gas and is a pathway to regime survival. We also discuss the broader

implications of AI playing such an important role in the country's future.

Why diversify the Saudi economy?

Saudi Arabia announced its plans to reduce its dependency on oil and gas and diversify its economy in April 2016, with the publication of the Kingdom's Vision 2030 programme. Currently, the oil and gas sector amount to approximately 50 per cent of gross domestic product, and 70 per cent of export earnings.³ However, Saudi Arabia's reliance on fossil fuels carries significant risks, prompting the need for transformation. Firstly, in the longer term, the global transition from hydrocarbon fuels to renewable and low-carbon energy represents an historical shift. Although the speed of this transition is presently insufficient, the need to circumvent the worst effects of global climate change adds greater pressure to develop and deploy new technologies while reducing hydrocarbon consumption. Failure to diversify its economy would leave Saudi Arabia vulnerable to significant changes in global energy markets.

Secondly, in the medium term, Saudi Arabia has a problem with its domestic energy consumption. Since 1965, the country's domestic consumption of energy has increased on average by 5 per cent per year. So, although internal consumption has slowed since 2015, linear projections continue to show a growing domestic demand within the foreseeable future (see Figure 1). Indeed, Glada Lahn and Paul Stevens' influential Chatham House report identified as early as 2011 that there is a 'hidden energy crisis' whereby the Saudis consume a quarter of all the oil they produce. Best projections show that Saudi Arabia could become a net oil importer by 2038, making the Kingdom's pattern of oil consumption unsustainable, and a transformation necessary.⁴

Thirdly, even in the short term, Saudi Arabia's energy infrastructure has shown itself to be vulnerable to attack. Following the September 2019 drone strike on the Abqaiq plant, nearly half of the country's daily oil production was taken offline, amounting to nearly 6 per cent of global production.

Although production levels were restored within a month, during that time, Saudi Arabia needed to import oil from surrounding countries to meet its export obligations. This exposed severe volatility, not least in oil prices that rose by as much as 20 per cent, and the global economy's vulnerability to crisis emanating from the broader insecurities of the Gulf region. Vision 2030 is designed to reduce these short- to long-term risks, and in order to implement it, Saudi Arabia is growingly reliant on advances in AI technology.

What is artificial intelligence?

Before outlining how Gulf states have begun adopting AI, it is important to recognise that AI is not new. The term 'artificial intelligence' can be traced back as far as 1956, and we can recognise work in the field of AI development from in the 1940s with the introduction of the 'Turing Test'. Devised by Alan Turing, the test sought to provide a working definition of intelligence, arguing that the ability to demonstrate machine intelligence would be demonstrated when a computer could passably simulate a human being. The thrust of AI development has sought to pass this test ever since. Effectively, AI is an attempt to build intelligent entities that can match or surpass human intelligence and rationality.

AI development has become a universal field, pulling interdisciplinary strands together to build machines that can function independently in complex and changing environments.⁵ Over seventy years, AI development has aimed at creating computer capabilities in four broad areas: natural language processing (NLP), knowledge representation (KR), automated reasoning (AR), and machine learning (ML). These capabilities have in isolated areas allowed computers to communicate in human languages, store the knowledge gathered from their senses, answer questions, draw new conclusions, and detect and extrapolate patterns in any new circumstances they find themselves. In concrete terms, these capabilities lie at the heart of modern technologies such as smartphone voice recognition, autopilot in planes, driverless cars, translation software, new

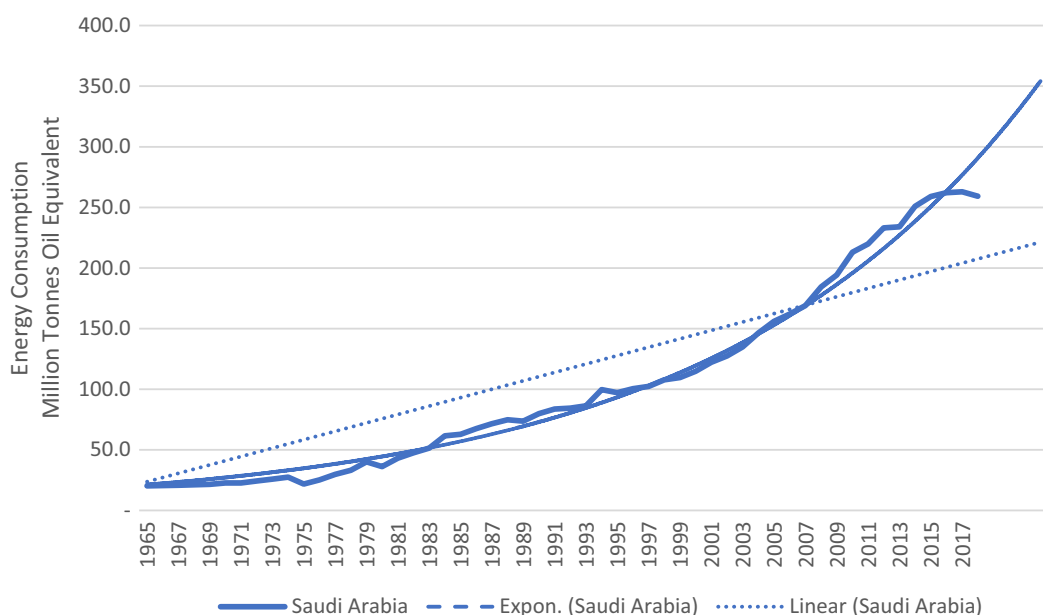


Figure 1: Internal Saudi energy consumption from 1965 to 2018

Source: BP Statistical Review of World Energy 2019 data. The figures are calculated by combining the total consumption of oil, natural gas and coal.

marketing techniques, investment fund managing, advances in security and surveillance software, facial recognition and autonomous drones, amongst other wide-ranging uses. The areas where AI is being applied are already vast and expanding as further advances are made, but we are already at the point where AI can 'see', 'hear', 'talk', 'smell', 'touch', 'move', write books, read books, play games and understand emotions.

The development of AI capabilities has historically ebbed and flowed. Successful strides forward have been followed by so-called 'AI winters'. However, what makes contemporary developments in AI stand out are three crucial developments. First is the way the technology began to be applied to the internet through the 1990s. This started to pull capabilities together and create a complete agent architecture with algorithms underlying internet search engines and website aggregators. Second, in addition to pulling capabilities together, researchers also turned to the internet as a source of big, free and instantly available data.⁶ They stopped focussing on the integrity of computer algorithms and started to concentrate on enormous datasets while 'being less picky about which algorithm to apply'.⁷ With the size of

data driving advancements in AI (because the more examples of something AI has, the faster and more accurately the technology can learn), this was a step-change in the development of this technology. It was akin to shifting steamships from coal to oil, allowing AI to move faster, further and into more domains than ever before. Third, AI has come to utilise the internet of things (IoT) combined with machine learning to feed its ever-growing need to gather data. Combined, these three advancements have laid the foundations of modern developments in AI, taking the technology from research labs and giving it practical use in our everyday lives. Accordingly, while there is considerable hyperbole about what AI can currently do, its growing ubiquity and potential have garnered the backing of the Saudi state and its sovereign wealth fund, also known as the Public Investment Fund (PIF).

How will AI be used to diversify the Saudi Arabian economy?

By 2025, global revenues from AI are expected to rise to \$90 billion, growing on average by 45 per cent each year.⁸ Beyond

this, longer term estimates project AI contributing to a 14 per cent growth of global GDP by 2030, 'the equivalent of an additional \$15.7 trillion'.⁹ Accordingly, AI represents a very significant commercial opportunity, and by pulling together trends and networks in this technology, Vision 2030 seeks to diversify the Saudi economy. To signal Saudi Arabia's commitment in this area, several grand gestures have already been made. For example, Saudi Arabia has become the first country in the world to grant citizenship to an AI-driven humanoid robot called Sophia. More substantially, the Kingdom is also in the process of building a new megacity called Neom, a mix of Arabic and Greek meaning 'new future'. Positioned in the north-western Tabuk province, this new 'independent international zone' will span territory from Saudi Arabia, Egypt and Jordan, covering an area of approximately 26,500 km². That is seventeen times the size of London, and only marginally smaller than Belgium. While Saudi Arabia is not relinquishing sovereign law within this space, it promises to be independent of the Kingdom's existing governmental framework.

To build Neom, the PIF has publicly committed \$500 billion. However, Saudi Arabia aims to combine its sovereign wealth with that of local and international investors. In return, the Kingdom has forecast Neom contributing an annual GDP return of \$100 billion by 2030. Moving away from oil and gas revenues, Neom will focus on developments in sixteen areas that have been identified as 'key economic sectors for the future':¹⁰

- Energy
- Water
- Mobility
- Biotech
- Food
- Manufacturing
- Media
- Entertainment, culture and fashion
- Technology and digital
- Tourism
- Sport
- Design and construction
- Services
- Health and well-being
- Education
- Livability

The objective of innovating in each of these sixteen areas, from renewable energy through to making citizens' lives more efficient, is to 'curb economic leakage in the Kingdom and the region in general' and it is already envisioned that AI and robotics will be a driving force behind innovations in each of these areas. As Crown Prince Mohammed bin Salman explained, in Neom, 'everything will have a link with artificial intelligence, with the internet of things—everything'.¹¹ As such, AI will be ubiquitously integrated into everyday life throughout the city. AI's integration will be designed to help facilitate the Kingdom's transition into an innovative technology hub, providing long-term economic stability.

Phase one of building Neom is currently underway and is due for completion during 2020. Neom airport is near completion and is registered as an official international airport; the residential area in Neom Bay is also under construction and will soon have the capacity to house 30,000 people. Nevertheless, beyond the plans to build physical infrastructure where there was once only desert, the Saudi government is undertaking more comprehensive institutional reforms to prepare for AI and this period of economic transition. By royal decree in the summer of 2019, The Saudi Data and Artificial Intelligence Authority, and the National Centre for Artificial Intelligence were established. These new institutions will link to a National Data Management Office, which looks to be a rebranding of the National Information Centre, currently run from within the Interior Ministry. Combined, these institutions are designed to underpin the governance structures and organisation of digitisation and AI within the Kingdom. These institutional reforms are not alone: officials are set to introduce educational reforms that would deliver digital skills into primary and secondary schools. In a highly conservative and traditional country, such reforms are intended to modernise Saudi society and slowly shift the country away from a rentier state towards 'innovation-driven economic growth'. As such, we can already see plans for a generational transformation taking shape as we approach 2030.

Political implications

Although Saudi elites have presented the overriding rationale for creating Neom and transitioning to an AI-driven future as benign and economically driven, we should not ignore the political implications of the transformation currently underway. Changes in the global economy and Saudi society are beginning to challenge the rentier state model, whereby petrodollars cannot be relied upon as a resource supporting the Saudi royal family. For example, as the Arab Spring spread in 2011, the Saudi regime demonstrated its reliance on co-opting sections of civil society using large sums of its oil wealth. King Abdullah declared nearly \$100 billion of new public spending in addition to a \$36 billion package of new jobless benefits, education and housing subsidies and debt write-offs targeted at youth, civil servants and the unemployed.¹² Taking Saudi patrimonialism to new heights, this increased overall public spending in 2011 by a quarter, reaching 25 to 28 per cent of Saudi GDP. Neom and economic diversification driven by AI is therefore not merely economic. By generating a new source of revenue, it is tied to the long-term stability and viability of the House of Saud. Acutely aware of their history, Saudi elites are seeking to prevent the collapse of the *third* Saudi state that is held together through religious and tribal associations and bargaining. The economic benefits of AI, it is planned, will allow the Saudi regime to change the way it has previously garnered wealth and power and contribute to the regime's survival.

Driven by AI, Saudi Arabia's technological modernisation will facilitate a pathway to the so-called 'China model' or 'Beijing consensus'. This combines autocratic rule with an embrace of free-market capitalism, and increasingly, a focus on digital surveillance of the domestic population. AI is needed for this, as it would allow the Saudi state to leapfrog industrialisation and shortfalls in state and institutional capacity. Neom is fundamental to realising this vision as it seeks to move Saudi Arabia into advanced manufacturing without industrialisation. However, AI is increasingly being seen as a 'dual-use', technology with serious ethical implications.

It has the potential to enhance military, economic and information supremacy. Just as AI can be programmed to watch for inefficient uses of water in a farmer's field or overuse of energy in a building, it is also capable of monitoring political opponents online, recognising faces at political rallies, and profiling a population's political persuasions. These have only recently started to spark debates about the ethics and uses of AI within mature democracies. Less space for debate exists in autocratic regimes such as those in the Gulf, and it is already clear that this technology is developing faster than public debate.

Conclusion

The importance and implications of AI technology are profound. As the Google CEO, Sundar Pichai, has described 'AI is one of the most important things humanity is working on. It is more profound than ... electricity or fire'.¹³ For countries such as Saudi Arabia, AI is being seen as the future engine of state transformation. A future that cannot be delivered by relying on hydrocarbon fuels. However, AI technology opens up a pathway for authoritarian persistence and regime survival beyond a reliance on energy resources. As Saudi Arabia builds Neom and seeks to become the centre of a global technology hub, it will also be attempting to ensure regime survival. It will attempt to cement a technologically enhanced neo-authoritarian model of governance that was not previously possible. As such, we can see Neom as an experiment for the Saudi state. However, it will also provide an early indication of how AI is likely to be further integrated into our lives. Accordingly, what happens in the Saudi desert over the next decade is likely to have an impact beyond economics and technology, and may well show us the 'new future' that AI development will bring.

Notes

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